

September 18, 2007

## **Texas Commission on Environmental Quality ODOR COMPLAINT INVESTIGATION PROCEDURES**

The following updates and supersedes the previous version of this document dated January 3, 2005, as well as all other guidance related to odor complaint investigations.

### **DETECTION OF ODOR AND INITIAL RESPONSE**

#### **Detection**

An odor may be detected by a citizen and reported to a Texas Commission on Environmental Quality (TCEQ) regional office as a citizen complaint, or detected by an investigator without a citizen complaint as the initiating factor. In either case, the regional office should promptly make a determination regarding the appropriate action based on the guidelines below. If an investigation is appropriate, the investigation should be conducted according to the procedures specified in this document and the attached flow chart.

#### **Initial Response**

If an odor is detected, and adverse health effects are alleged by a complainant, or suspected by the investigator, it should be prioritized for immediate response, and an investigation should be conducted as soon as possible, regardless of the manner of detection. The definition of "alleged" or "suspected" health effects should remain very broad in this situation, to ensure that appropriate actions are taken any time there is a potential imminent threat to public health and safety.

If an odor is detected by either a complainant or an investigator, and adverse health effects are not alleged or suspected, an investigation should be conducted to determine the cause of the odor (or alleged odor) according to the incident prioritization procedures established by the Field Operations Division.

### **INVESTIGATION/DATA GATHERING**

Following is a brief discussion of the information which should be collected and evaluated by the regional staff in a potential nuisance odor situation. This discussion is not intended to restrict the collection of any information which the investigator considers appropriate or necessary to evaluate the citizen concerns.

It should be noted that the following protocol assumes that the investigation was initiated by receipt of an odor complaint from a citizen. In order to successfully pursue a nuisance violation, there must be an identifiable aggrieved party (complainant).

If the investigation is initiated as the result of detection of an odor by an agency investigator (no complainant), or if the complainant requests anonymity, the purpose of the investigation would be to determine the cause of the odor and require corrective actions, if appropriate, rather than to confirm nuisance conditions. If, however, during the course of an investigation that was initiated by the investigator, an aggrieved party is identified, the investigator should proceed with the following investigation protocol to document the presence or absence of nuisance odor.

#### Complaint Information

The following information should be gathered by the regional office at the time that a complaint is received by telephone. If the complaint is received in some other manner, this information should be collected prior to the investigation.

- o Name(s) and address(es) of complainant(s).
- o Location where complainant(s) experienced the odor.
- o Dates, times, frequency, and duration when the complainant(s) experienced the odor.
- o Nature of any allegation of adverse effects on the complainant's health, property, animals, or vegetation.
- o Nature of any allegation of interference with the normal use and enjoyment of the complainant's property, animals, or vegetation.
- o Alleged source of the odor.

#### Investigation Data/Information

All odor complaint investigation activities and results should be documented in the investigation report. The items and discussion below should be included in the investigation, but should not be construed as limiting either the collection or reporting of relevant information.

- o Attempt to locate and assess the odor first-hand. It would be ideal if an investigator could be at the complainant's location at the time that the odor is occurring, in order to experience the same conditions that generated the complaint. This may not be possible, but an effort should be made to duplicate the experience of the complainant, unless the conditions are

considered potentially unsafe.

- o Describe the intensity and offensiveness of any odors observed during the investigation using the terms identified for those factors on the FIDO Chart (copy attached). (“FIDO” is an acronym for Frequency, Intensity, Duration, and Offensiveness).
- o Describe any physical effects experienced by the investigator which are indicative of adverse effects upon health (burning eyes, nose, throat, headache, vomiting, etc.)
- o Describe the normal use of property affected by the odor, and the manner in which such odor could reasonably be expected to interfere with this use.
- o Determine and document the extent of the odor plume. Document on a map of the vicinity the odor survey route, the time the investigator was at each location, and the odor observations at each location. This survey should include upwind and downwind observations at least.
- o Attempt to locate the source(s) of the odor.
- o If a source is identified, attempt to locate the specific cause of the odor (i.e., the specific compound, equipment, or process emitting the odor, and the reason(s), such as a plant upset).
- o Gather local meteorological data for the time when the complainant(s) alleged the occurrence of the odor, as well as the time when the investigation was conducted. This should include, at a minimum, estimates of wind speed and direction, temperature, humidity, precipitation, and sky cover.
- o Describe the terrain features of the area, including natural and man-made features which could influence the flow of air.
- o If the investigator has detected odors at the same location at other times, document a comparison of the current observations with the prior observations.
- o Collect information about the frequency and duration of any observed odors. This includes observations by the investigator during the course of the investigation, and information provided by the complainant or the source relative to these factors.
- o In some cases, such as recurring short-term odor situations, the investigator may ask the complainant to maintain a log of odor observations to document conditions related to the odors experienced. The complainant should be asked to utilize the same terminology as

used on the FIDO Chart.

This log can be used to validate or invalidate complaints in conjunction with the other evidence of the case. It would not be used as the sole basis for issuance of a notice of violation. The attached "Odor Log" format should be used in all such situations.

- o The investigator may conduct interviews of other citizens in the area surrounding the complainant's location with the intention of gathering information or evidence to assist in a determination of the validity of the complaint. Caution should be taken, however, to ensure that this information-gathering procedure not be construed as "soliciting" additional complaints.

### **INVESTIGATION FOLLOWUP**

Upon completion of the investigation, the information collected should be reviewed to determine whether a nuisance condition is confirmed. Based on statutory and regulatory language, a nuisance odor exists if an odor has been emitted in such concentration and duration as to a) be injurious to or adversely affect human health, welfare, animal life, vegetation, or property, or b) interfere with normal use and enjoyment of animal life, vegetation, or property. In the first case, if any adverse effect or injury is documented, the source should be required to take measures to mitigate the odor, and the regional office should initiate appropriate enforcement action against the responsible party. If such adverse effects or injury are not confirmed, the FIDO Chart would be used to evaluate the frequency, intensity, duration, and offensiveness of the odor, and to determine whether the evidence in the case constitutes a nuisance violation.

#### **Adverse Impacts**

If the preponderance of the evidence collected during the course of the investigation (including discussions with the complainant and observations by the investigator) confirms the presence of odors in such concentration and duration as to be injurious to or adversely affect human health, welfare, animal life, vegetation, or property, remedial action should be immediately required to mitigate the odors, and appropriate enforcement action should be initiated according to agency enforcement procedures. In this situation, these actions should be taken regardless of whether the incident was complaint-generated or detected by the investigator.

#### **Interference with Normal Use and Enjoyment of Animal Life, Vegetation, or Property**

If the preponderance of the evidence does not confirm the presence of odors in such concentration and duration as to be injurious to or adversely affect human health, welfare, animal life, vegetation, or property, the investigator should evaluate all the evidence collected during the

course of the investigation using the FIDO Chart. This chart is used to determine whether a nuisance odor violation should be issued based on whether the frequency, intensity, duration, and offensiveness of observed and documented odors combine to cause interference with the normal use and enjoyment of animal life, vegetation, or property.

Each of the four tables on the FIDO Chart represents a level of offensiveness (Highly Offensive, Offensive, Unpleasant, and Not Unpleasant). The intensity of the observed odor is documented using the legend on the right side of the chart, with “VS” representing Very Strong odors, “S” for Strong, “M” for Moderate, “L” for Light, and “VL” for Very Light. The frequency and duration are then plotted on the horizontal and vertical axes of the appropriate table. If the odor situation is at least as intense as the colored block in which it is plotted, it is considered a nuisance odor. If the plot falls outside the colored area of the table (NA), the odor does not represent a nuisance.

Intensity and offensiveness are two distinct factors which should be evaluated separately. Offensiveness is the innate character of the odor which can be distinguished even in very light concentrations. Intensity is the relative measure of the perceived concentration. Investigators learn to determine relative intensity through experience and/or training. The FIDO Chart incorporates these two distinct factors along with frequency and duration into one integrated tool.

If application of the FIDO Chart confirms a nuisance odor (confirms odors in such concentration and duration as to interfere with the normal use and enjoyment of animal life, vegetation, or property), the regional office should require the responsible party to correct the problem, issue a nuisance odor violation, and initiate appropriate enforcement action based on agency enforcement procedures.

### **EXAMPLE APPLICATION OF THE FIDO CHART DURING ODOR COMPLAINT INVESTIGATIONS**

Following are brief discussions of example nuisance odor complaint investigations, and use of the FIDO Chart to evaluate whether or not nuisance conditions should be cited.

#### **Example 1–Rendering Plant Odor**

##### **Scenario 1**

A citizen complaint is received alleging “horrible odors” from a nearby rendering plant that occur almost every morning about 10:00 a.m., and last for about an hour. The investigator discusses this with the complainant and arranges to conduct an investigation at 10:00 a.m the following morning. Upon arrival at the complainant’s residence, the investigator notices the odor which is consistent with improperly treated wastewater from a rendering plant. Further

investigation confirms that the rendering plant less than 1/4 mile away is the source of the odor. By 11:00 a.m., the odor has almost completely gone away.

Using the FIDO chart, the investigator characterizes the odor as Highly Offensive, as indicated in the “Odor Characterization Examples” on the back of the chart, and determines that the intensity is Strong. Based on testimony from the complainant, and on-site observation, the investigator determines that the odor only lasts for about an hour. The FIDO chart indicates that a Highly Offensive odor lasting for about an hour in a single occurrence must be at least Very Strong to be considered a nuisance (see Figure 1). No violation is confirmed at this time.

		ODORS CHARACTERIZED AS <b>HIGHLY OFFENSIVE</b>				
		FREQUENCY				
		Single Occurrence	Quarterly	Monthly	Weekly	Daily
D U R T I O N	1 minute	NA	NA	VS	S	M
	10 minutes	NA	VS	S	M	L
	1 hour	VS	S	M	L	VL
	4 hours	S	M	L	VL	VL
	12 hours+	M	L	VL	VL	VL

Figure 1

However, based on testimony from the complainant that this strong odor occurs almost every day, usually about the same time, the investigator goes to the rendering plant and discusses this situation with the operations manager. It is determined that a process which is conducted at about this time every day is responsible for the odor.

Given all the evidence gathered in this investigation, it is determined that a Strong, Highly Offensive odor is likely to affect the complainant on almost a daily basis under the plant’s current operating conditions. Review of the FIDO Chart shows that a Strong, Highly Offensive odor which lasts for about an hour only has to occur as often as quarterly to be considered a nuisance and justify a Notice of Violation. The Chart also shows that a Highly Offensive odor only has to have a Very Light intensity to be considered a nuisance if it occurs for an hour on a daily basis (see Figure 2).

		ODORS CHARACTERIZED AS <b>HIGHLY OFFENSIVE</b>				
		FREQUENCY				
		Single Occurrence	Quarterly	Monthly	Weekly	Daily
D U R E T I O N	1 minute	NA	NA	VS	S	M
	10 minutes	NA	VS	S	M	L
	1 hour	VS	S	M	L	VL
	4 hours	S	M	L	VL	VL
	12 hours+	M	L	VL	VL	VL

Figure 2

The investigator therefore concludes that this citizen has been subjected to a nuisance odor, and determines that a Notice of Violation is appropriate.

**Scenario 2**

If, during the course of the investigation, it is determined that the Strong, Highly Offensive odor occurs every two or three weeks, sometimes for only 10 or 15 minutes, sometimes for up to an hour, the investigator would need to “read between the lines” on the chart to estimate where the frequency and duration of this odor should be placed. In this case, the chart indicates that a Strong, Highly Offensive odor occurring for 10 minutes on a monthly basis would constitute a nuisance, or that it would only have to occur for one minute at a time on a weekly basis to be considered a nuisance. Since this odor has been documented to occur for between 10 minutes and an hour, and occurs more often than monthly, but less often than weekly, it would be reasonable to conclude that the odor is a nuisance.

**Example 2 – Auto Body Shop Paint Odor**

**Scenario 1**

A complainant alleges “paint odors” from a nearby auto body shop are so strong and unpleasant that he can’t go in the back yard to play with his kids. He says that normally the odors from the body shop are not a problem, but that since about 8:00 a.m. on this day, they are terrible. An investigator arrives to conduct an odor complaint investigation at 11:00 a.m.

The investigator determines that organic solvent odors from the painting operation, categorized as Offensive according to the “Odor Characterization Examples” on the back of the FIDO Chart, are impacting the complainant’s property with a Strong intensity. The odors continue for one

more hour, until 12:00 p.m.

During the investigation at the facility, it is determined that a fork lift operator had accidentally knocked off the paint spray booth stack the night before and when painting began that morning the solvents were being emitted at ground level without the dilution afforded by the tall stack. At 12:00 p.m., the plant manager agrees to discontinue the painting process until the stack is repaired.

Application of the FIDO Chart for this one-time odor event (Frequency = Single Occurrence) indicates that an odor characterized as Offensive, with intensity characterized as Strong, with a duration of four hours, does not represent a nuisance. The FIDO Chart indicates that a single occurrence of an Offensive odor for four hours must be at least Very Strong to constitute a nuisance violation (see Figure 3 on next page).

		ODORS CHARACTERIZED AS OFFENSIVE				
		FREQUENCY				
		Single Occurrence	Quarterly	Monthly	Weekly	Daily
D U R A T I O N	1 minute	NA	NA	NA	VS	S
	10 minutes	NA	NA	VS	S	M
	1 hour	NA	VS	S	M	L
	4 hours	VS	S	M	L	VL
	12 hours+	S	M	L	VL	VL

Figure 3

**Scenario 2**

The complainant states that the odors from the nearby auto body shop are not real strong, but that they happen just about every day, and usually last for about an hour. The odor is annoying because it is so frequent. When the investigator arrives, there are no odors present.

Investigation at the facility reveals that most of the work at the shop does not involve painting, and that they “batch” each day’s painting, resulting in perhaps an hour or so of painting each day.

Several investigations are conducted over the next few weeks. During two of these investigations painting operations are being conducted, and Light to Moderate odors are confirmed at the complainant’s property for an hour or a little more.

Application of the FIDO Chart indicates that odors characterized as Offensive, with Light intensity, which impact the complainant for approximately one hour (duration) on a daily basis (frequency), do represent a nuisance violation (see Figure 4).

**Scenario 3**

The complainant states that strong paint odors from the auto body shop are experienced occasionally throughout the day about one day a week. They usually only last about 10 or 15

		ODORS CHARACTERIZED AS <b>OFFENSIVE</b>				
		FREQUENCY				
		Single Occurrence	Quarterly	Monthly	Weekly	Daily
D U R I O N	1 minute	NA	NA	NA	VS	S
	10 minutes	NA	NA	VS	S	M
	1 hour	NA	VS	S	M	L
	4 hours	VS	S	M	L	VL
	12 hours+	S	M	L	VL	VL

Figure 4

minutes at a time, but that on the days when they do occur, they become very annoying. When the investigator arrives to conduct an investigation, there are no odors observed, but the complainant indicates that the wind has shifted and the odors have disappeared. An odor survey confirms Strong, Offensive odors from the spray painting operation at a point downwind of the facility at the same distance as the complainant’s house.

Investigation of meteorological conditions indicates that the complainant’s residence is not downwind of the body shop according to prevailing wind direction, but that when the complaint was made, the residence was downwind of the facility. It also confirms that, typically, the complainant’s house is downwind of the facility about one day each week.

Investigation at the facility reveals that painting occurs off and on during every work day and that there is only a short paint spray booth stack, thus limiting dispersion. The investigator concludes that Strong, Offensive odors are likely to impact the complainant any time painting operations are underway and the residence is downwind of the facility.

Review of the information collected during this investigation, and application of the FIDO Chart, indicates that the offensive painting odors are impacting the complainant’s residence for 10 to 15 minute periods throughout any day when the orientation of the wind puts the residence downwind of the body shop. The frequency of this occurrence would be plotted as Weekly, since the wind direction causes the odors to impact the complainant’s residence approximately weekly. The duration is at least 10 minutes (likely more) on these days. The FIDO Chart (See Figure 5) indicates that an Offensive odor with a Strong intensity on a weekly basis for 10

minutes or more is considered a nuisance. A notice of violation is therefore issued.

		ODORS CHARACTERIZED AS OFFENSIVE				
		FREQUENCY				
D U R A T I O N		Single Occurrence	Quarterly	Monthly	Weekly	Daily
	1 minute	NA	NA	NA	VS	S
	10 minutes	NA	NA	VS	S	M
	1 hour	NA	VS	S	M	L
	4 hours	VS	S	M	L	VL
	12 hours+	S	M	L	VL	VL

Figure 5

### Example 3 – Landfill Odor

#### Scenario 1

A complainant alleges “sickeningly sweet” garbage odors from a nearby landfill that are sometimes so bad he cannot spend any time in his yard. He adds that sometimes it is so bad he cannot open the windows of his house since the smell would come inside. The odors tend to be worse when the weather is quite cool and calm, especially in the late evening and early morning hours.

Using this information, the investigator determines that an investigation should be conducted after-hours. The investigator arrives in the complainant’s neighborhood at 6:00 a.m. on a cool and calm morning, when the odors should be at their worst. No odors are noted at the complainant’s address but during a drive through the neighborhood, the investigator notes garbage odors of Moderate intensity in various parts of the neighborhood until about 7:00 a.m. The odors diminish rapidly after the sun has risen and the winds have picked up.

Using the FIDO Chart, the investigator characterized the odor as Offensive, as indicated in the “Odor Characterization Examples” on the back of the chart. Plotting it as a Single Occurrence for one hour, no nuisance is confirmed (See Figure 6). The chart indicates that for a Single Occurrence, an odor must be at least Very Strong for four hours to be considered a nuisance, so no violation is documented. However, the chart also indicates that a Moderate odor occurring for one hour on a weekly basis would be considered a nuisance. The investigator would need to conduct additional investigations and collect additional information regarding the frequency and duration of these odors to make a final determination.

		ODORS CHARACTERIZED AS OFFENSIVE				
		FREQUENCY				
		Single Occurrence	Quarterly	Monthly	Weekly	Daily
D U R I O N	1 minute	NA	NA	NA	VS	S
	10 minutes	NA	NA	VS	S	M
	1 hour	NA	VS	S	M	L
	4 hours	VS	S	M	L	VL
	12 hours+	S	M	L	VL	VL

Figure 6

**Scenario 2**

During the course of the investigation, the investigator determines the intensity of the odor is Light and that it lasts approximately 10 minutes. Three followup investigations during the next three weeks result in:

1. No odors detected.
2. An odor of light intensity that lasts for less than 10 minutes.
3. An odor of very light intensity that lasts for about two hours.

The conclusion is that the odors occur for between 10 minutes and 2 hours at a Light to Very Light intensity on a weekly basis (approximately).

Evaluation of the FIDO Chart indicates that an offensive odor occurring weekly for one hour would have to be at least a Moderate intensity to be considered a nuisance (See Figure 7). For an offensive odor at a Light intensity, the odor must have a duration of at least four hours on a weekly basis, or one hour on a daily basis to be considered a nuisance. In this case, although some odor is frequently observed, the intensity and duration are not great enough to confirm that a nuisance condition exists.

**ODORS CHARACTERIZED AS OFFENSIVE**

		F R E Q U E N C Y				
		Single Occurrence	Quarterly	Monthly	Weekly	Daily
D U R I O N	1 minute	NA	NA	NA	VS	S
	10 minutes	NA	NA	VS	S	M
	1 hour	NA	VS	S	M	L
	4 hours	VS	S	M	L	VL
	12 hours+	S	M	L	VL	VL

Figure 7

**Scenario 3**

A complaint is received alleging that landfill odor is occurring in the neighborhood again, as it does on a regular basis. Review of the file indicates that such complaints have been received and investigated 16 times in the previous 12 month period, at least once per month. Further review indicates that investigators have confirmed Moderate to Strong odors occurring for approximately one hour on four different occasions. Review of complaint records, including odor logs kept by complainants, provides documentation that Moderate to Strong landfill odors are occurring in this neighborhood on about a monthly basis for 30 minutes to an hour at a time.

Using the FIDO Chart for Offensive odors, it is determined that an odor occurring on a monthly basis for one hour at a time must have at least a Strong intensity to be considered a nuisance. The same odor with a Moderate intensity would have to occur on a weekly basis to be considered a nuisance (See Figure 8). Since the documented odors are only Moderate to Strong (not consistently Strong), and their duration is usually less than one hour, a nuisance violation is not confirmed.

**ODORS CHARACTERIZED AS OFFENSIVE**

		F R E Q U E N C Y				
		Single Occurrence	Quarterly	Monthly	Weekly	Daily
D U R I O N	1 minute	NA	NA	NA	VS	S
	10 minutes	NA	NA	VS	S	M
	1 hour	NA	VS	S	M	L
	4 hours	VS	S	M	L	VL
	12 hours+	S	M	L	VL	VL

Figure 8

# ODOR COMPLAINT INVESTIGATION PROCEDURES

## FIDO CHART

### ODORS CHARACTERIZED AS **HIGHLY OFFENSIVE**

		FREQUENCY				
		Single Occurrence	Quarterly	Monthly	Weekly	Daily
D U R A T I O N	1 minute	NA	NA	VS	S	M
	10 minutes	NA	VS	S	M	L
	1 hour	VS	S	M	L	VL
	4 hours	S	M	L	VL	VL
	12 hours+	M	L	VL	VL	VL

### ODORS CHARACTERIZED AS **OFFENSIVE**

		FREQUENCY				
		Single Occurrence	Quarterly	Monthly	Weekly	Daily
D U R A T I O N	1 minute	NA	NA	NA	VS	S
	10 minutes	NA	NA	VS	S	M
	1 hour	NA	VS	S	M	L
	4 hours	VS	S	M	L	VL
	12 hours+	S	M	L	VL	VL

### ODORS CHARACTERIZED AS **UNPLEASANT**

		FREQUENCY				
		Single Occurrence	Quarterly	Monthly	Weekly	Daily
D U R A T I O N	1 minute	NA	NA	NA	NA	VS
	10 minutes	NA	NA	NA	VS	S
	1 hour	NA	NA	VS	S	M
	4 hours	NA	VS	S	M	L
	12 hours+	VS	S	M	L	VL

### ODORS CHARACTERIZED AS **NOT UNPLEASANT**

		FREQUENCY				
		Single Occurrence	Quarterly	Monthly	Weekly	Daily
D U R A T I O N	1 minute	NA	NA	NA	NA	NA
	10 minutes	NA	NA	NA	NA	NA
	1 hour	NA	NA	NA	NA	VS
	4 hours	NA	NA	NA	VS	S
	12 hours+	NA	NA	VS	S	M

INTENSITY LEGEND
VS
Very Strong
S
Strong
M
Moderate
L
Light
VL
Very Light



## ODOR CHARACTERIZATION EXAMPLES

The character of an odor is a unique, innate quality of an odor that does not vary with intensity. Under normal circumstances the following types/sources/processes may be characterized as indicated below, however, these examples should only be used as a guide; characterization should be based on the investigator's experience and training.

### Highly Offensive

- \* Blood drying operations
- \* Sewage treatment primary sludge
- \* Putrefying animals/fish
- \* Hide processing
- \* Rancid grease
- \* H<sub>2</sub>S (Landfill gas, leachate, paper mill black liquor, etc.)
- \* Mercaptans (natural gas odorant)

### Offensive

- \* Landfill garbage/waste
- \* Cattle lagoon cleanout
- \* Confined hog/poultry operations under best management practices
- \* Decaying silage/composting
- \* Unprocessed rendering plant material and wastewater
- \* Typical grease trap odor
- \* Waste burning (rubber, plastic, tires, other non-wood materials)
- \* Failing or improperly operated septic systems
- \* Organic products like auto-body paint & styrene (fiberglass, cultured marble mfg)<sup>1</sup>

### Unpleasant

- \* Well digested or chemically-treated sludge
- \* Cattle operation under best management practices
- \* Waste-activated sludge processes
- \* Water-based painting
- \* Gasoline, diesel fuel
- \* Diesel exhaust
- \* Asphalt odors
- \* Burned coffee/food
- \* Brush/wood burning
- \* Ammonia
- \* Chlorine

### Not Unpleasant

- \* Ketones, esters, alcohols
- \* Fresh-cut grass or hay
- \* Normal coffee roasting
- \* Normal food preparation
- \* Bakery
- \* Perfume
- \* Spice packaging
- \* Winery

<sup>1</sup>At low concentrations, organic products such as autobody paint and styrene used in fiberglass and cultured marble operations would not normally be considered to have offensive odors. However, because of a person's potential physical response to these products at higher concentrations (where most complaints concerning these products occur), we generally consider them to have offensive characteristics.

## DETERMINING FREQUENCY/DURATION

You are attempting to determine the frequency and duration that the complainant experiences over time. The frequency and duration observed during a single investigation may not accurately represent what the complainant is experiencing. You may have to use information gathered from multiple investigations (investigator observations as well as any information gathered on plant processes, weather, terrain, or complainant information) to make this determination. Consider the following:

### Plant Processes

- \* Constant, seasonal, intermittent processes/activities (e.g., reactor top opened)
- \* Upset conditions, maintenance, startup & shutdown, etc.
- \* Plant records, sampling data, CEM data, etc.

### Weather

- \* Wind rose from source to receptor
- \* Temperature or other meteorological data that could affect intensity or duration.
- \* Wind speed day, night, summer, winter
- \* CAMS Station/NWS data

### Terrain

- \* Low areas/channels/valleys where odors can funnel
- \* Changes that could affect local wind patterns

### Complainant Information

- \* Statements as to frequency and duration
- \* Logs - time, effects, source operations, weather conditions
- \* Knowledge of source operations - times, processes
- \* Neighbor and/or visitor corroboration

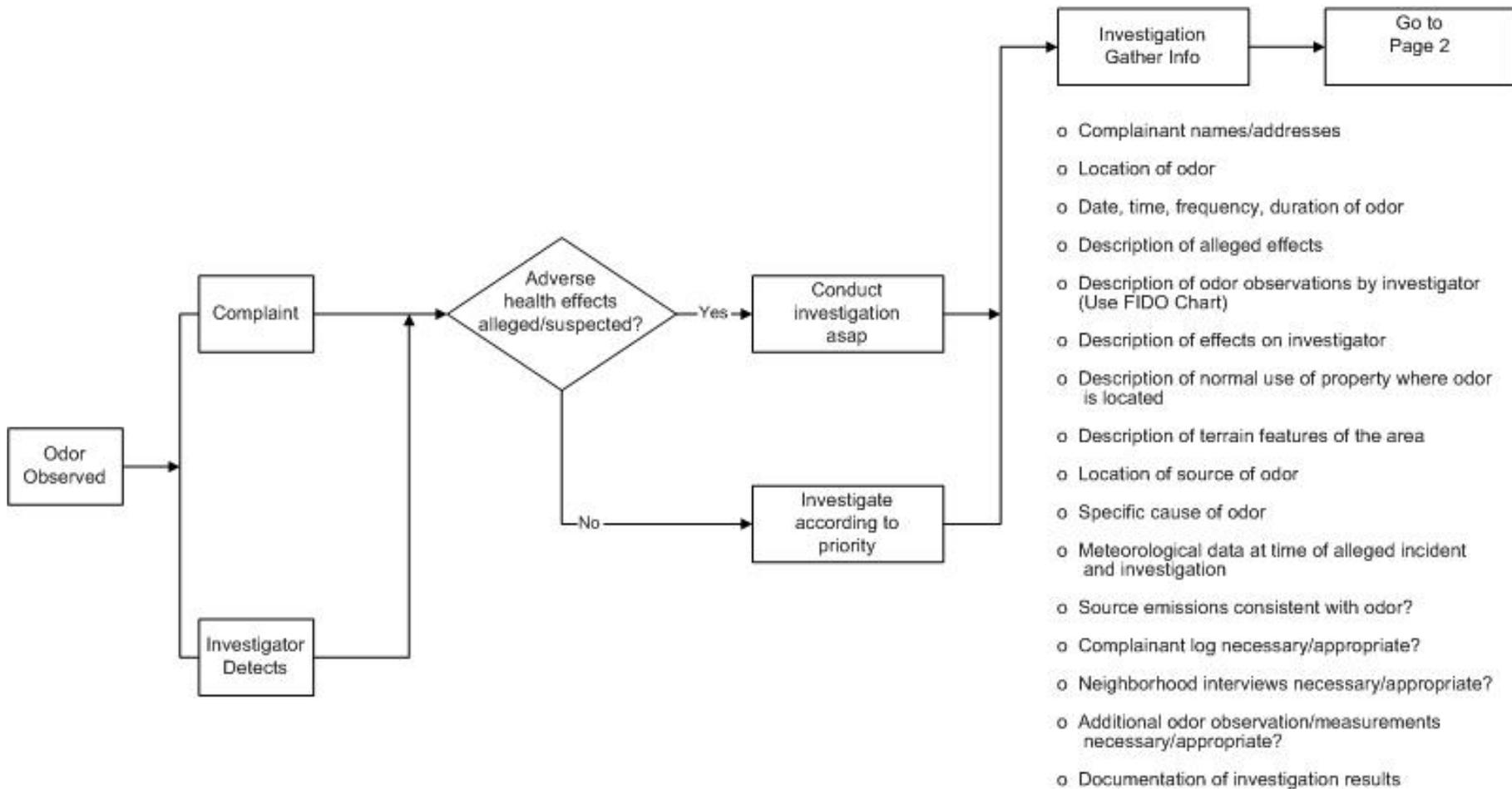
## HOW TO USE THE FIDO CHART

Each of the four tables on this FIDO Chart represents a different level of offensiveness (Highly Offensive, Offensive, Unpleasant, and Not Unpleasant). The intensity of the observed odor is documented using the legend on the right side of the chart--with "VS" for Very Strong odors, "S" for Strong, "M" for Moderate, "L" for Light, and "VL" for Very Light. Once the overall frequency and duration have been determined (based on one or more investigations), they are then plotted on the horizontal and vertical axes of the appropriate table. If the odor situation is at least as intense as the colored block in which it is plotted for the corresponding duration and frequency, it is considered a nuisance odor. If the plot falls outside the colored area of the table (NA), the odor does not represent a nuisance.

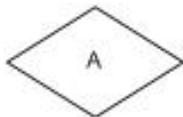
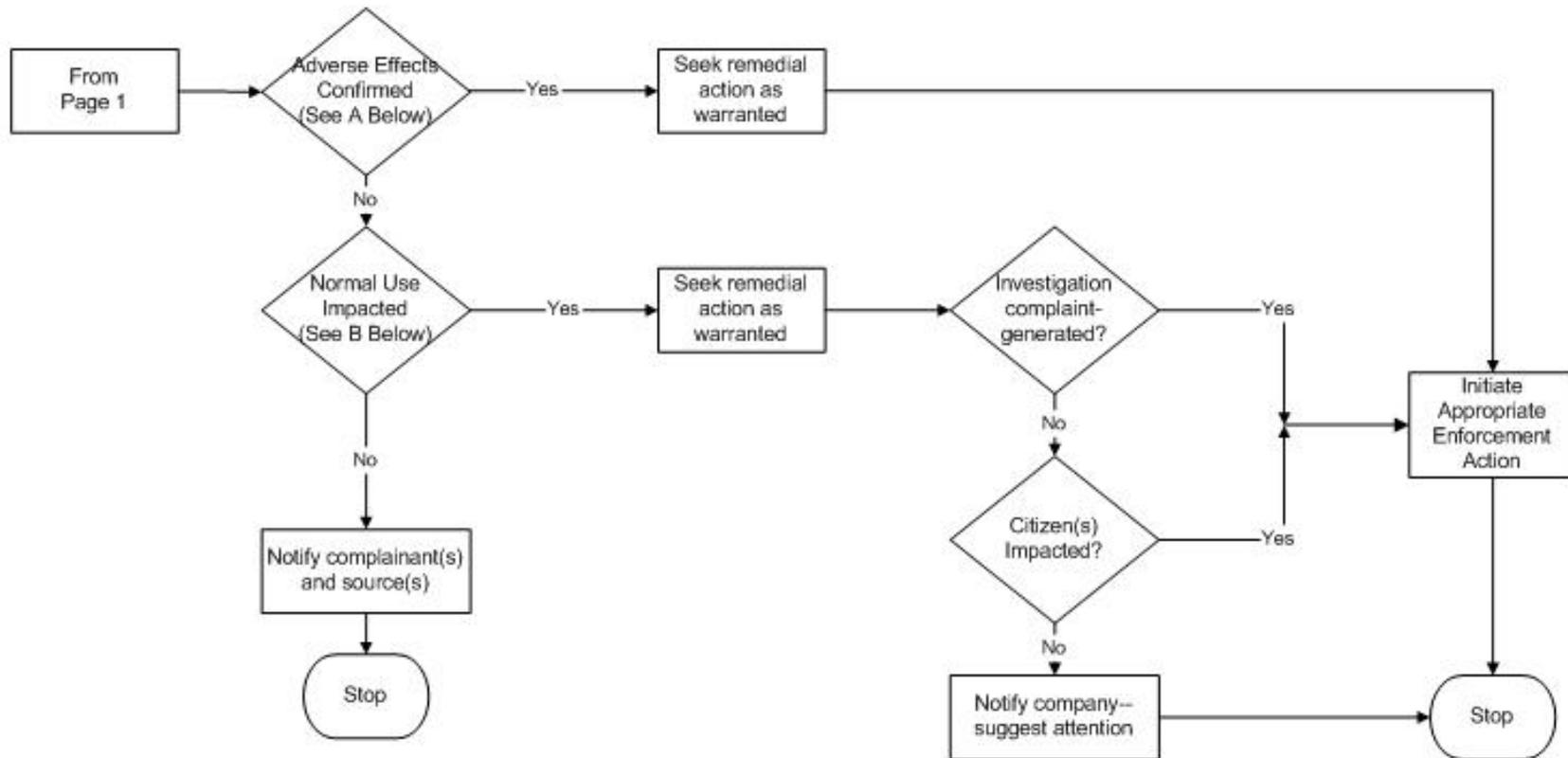
To summarize, you should analyze the information obtained from all investigations and document the following (FIDO):



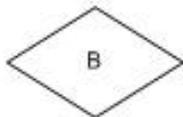
## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY Nuisance Odor Complaint Investigation Process



## Nuisance Odor Complaint Investigation Process (cont'd)



Preponderance of evidence (investigation results) indicates odor in such concentration and duration as to be injurious to or adversely affect human health, welfare, animal life, vegetation, or property.



Preponderance of evidence (investigation results using FIDO Chart) indicates odor in such concentration and duration as to interfere with normal use and enjoyment of animal life, vegetation, or property.